

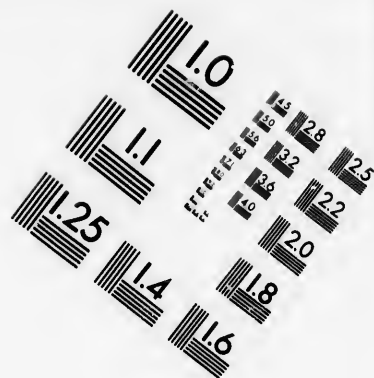
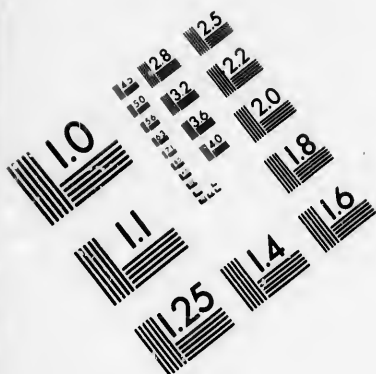
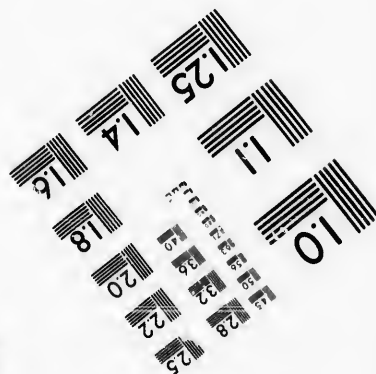
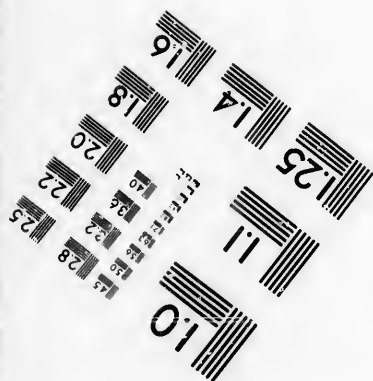
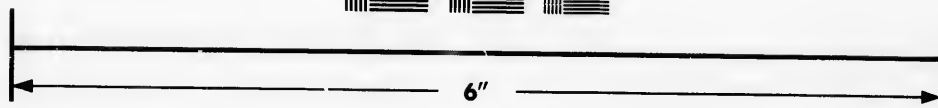
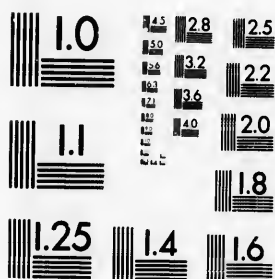


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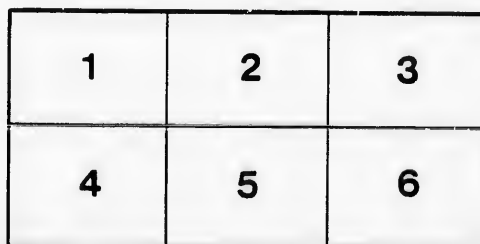
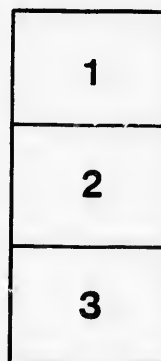
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"Correspondence relative to the continuation of the Toronto Observatory, ordered by the Council of the Royal Society to be printed.

"1. *From Lieut.-Colonel Sabine to the Earl of Rosse, P.R.S.*

"Woolwich, June 29, 1850.

"MY LORD,—I beg to bring under your Lordship's consideration the propriety of recommending to Government the continuance of the Magnetical Observatory at Toronto in Canada upon its present establishment and on its present footing, from March 31, 1851 (which is the date which is now sanctioned) to March 31, 1853.

"I make this proposition chiefly on the three following grounds:—

"1st. To afford time for the completion of the series of absolute determinations, the objects and progress of which are stated in the accompanying paper, No. 1*, and where also the important conclusions are shown to which the part of the series already accomplished appears to conduct.

"2nd. To afford time for the trial of the comparative merits and disadvantages of the two kinds of photographic self-registering apparatus respectively invented by Mr. Ronalds and Mr. Brooke; as available methods in the colonies or at stations where the supervision of the inventor cannot be obtained, and where the appliances, mechanical and chemical, which a great metropolis affords are not at hand.

"3rd. For the comparison of the magnetic registers which will be thus obtained with the extensive system of Auroral Observation which has been organized by Captain Lefroy, and which now extends over the greater part of the continent of North America, as shown by the accompanying paper, No. 2†.

"With reference to the second of the three grounds above enumerated, I beg to submit the accompanying paper, No. 3, which is an account drawn up by Captain Lefroy, Director of the Toronto Observatory, for Silliman's Journal, of Mr. Brooke's apparatus (which had been for some months in action at his observatory), as I consider that it evidences the competency of Captain Lefroy to conduct the comparative trial with which he has been charged. At the period when that paper was written, viz. in January 1850, Mr. Brooke's Declinometer was the only self-registering magnetical instrument at the Toronto Observatory. A Bifilar and a Balance Magnetometer, both on Mr. Ronalds's principle, have since been received there, and a Bifilar, on Mr. Brooke's principle, is now on its passage. An accidental circumstance (viz. the breaking out of cholera in August 1849 in the ship which was conveying Mr. Ronalds's apparatus to America, and which obliged her to put back to England until the re-opening of the season of navigation of the St. Lawrence in the pre-

* Philosophical Transactions, 1850, Art. IX.

† Report printed in the Philosophical Magazine for June 1850.

sent spring) retarded the commencement of the comparative trial of the two methods, but, on the other hand, it has given time for the system of auroral observations to be more fully matured as well as more widely extended. Independent of the important conclusions which are likely to be derived from the comparison of this most extensive system of auroral observation with a continuous self-registry of the magnetic phenomena, it is obvious that the attention which the whole subject will thus receive is well-suited to place in clear evidence the deficiencies of either or both of the methods of self-registry in reference to the present stage of scientific inquiry, and to lead to such improvements as may be required.

"At an earlier period of the Toronto Observatory, and before the invention of self-registering apparatus, it was contemplated that when certain primary objects should have been accomplished, the observatory might be advantageously transferred to the provincial authorities, under whom it might be continued permanently. The invention of self-registering apparatus has led to the postponement of this period of transfer. An observatory furnished with self-registering apparatus, working on a well-established system, will obviously be far more valuable as a provincial establishment than an observatory in the state in which the transfer was originally contemplated.

"There is no reason to doubt that the Toronto Observatory will be in this improved state (if continued according to the present proposition) by the 31st of March, 1853; and I learn, from communications which Captain Lefroy has recently had with members of the present Colonial Ministry, that when the proper time shall be considered to have arrived for the transfer of the Observatory from Her Majesty's Government to the provincial authorities, the Colonial Ministry, should the same be still in power, are disposed to advise the Governor-General to recommend to the Provincial Parliament an appropriation for its support.

"The present proposition for continuance under Her Majesty's Government is therefore definite, the transfer to take place on the 31st of March, 1853, or the instruments to be brought home and the observatory dismantled.

"The cost of the Toronto Observatory, on its present establishment and footing, is £402 a year, £302 being for extra pay for the officer and detachment of the Royal Artillery, and £100 for contingencies.

"The Toronto Observatory was originally established under the Ordnance department (with the sanction of the Treasury), on the recommendation of the Royal Society, and its general superintendence, with that of other colonial observatories of the same description, was entrusted, by the late Lord Vivian, then Master-General of the Ordnance, to me. As its Superintendent, I consider that I discharge my duty in bringing the subject of the future disposition of this observatory under your Lordship's consideration as President of the Royal Society. The scientific instructions, under which this and the other observatories have continued to act, emanated from

the Royal Society, and were drawn up by a committee consisting of Sir John Herschel, Dr. Lloyd, the Dean of Ely, Dr. Whewell and myself.

"Perhaps your Lordship will wish to take the opinion of these four gentlemen (and possibly of others) on the question thus brought under your consideration. If there are additional details or information desired, I shall be most happy to supply them, as far as may be in my power.

"I have the honour to be,

"My Lord, your Lordship's obedient Servant,
(Signed) "EDWARD SABINE."

"The Earl of Rosse,
President of the Royal Society."

"2. From Lieut.-Colonel Sabine to the Earl of Rosse, P.R.S.

"Woolwich, October 22nd, 1850.

"MY LORD,—At a meeting of the American Association for the Advancement of Science, held at Newhaven in the United States in August last, resolutions were adopted regarding the continuance of the Toronto Observatory, and the cooperation of the British Government in a system of Meteorological Observations in the North American Continent, of which the United States portion is to be carried on at the expense of the United States Government, under the Smithsonian Institution. It is intended, I understand, that these resolutions shall be communicated by the Government of the United States to ours, through the American Minister resident in London; and they will in such case, I presume, come into your Lordship's hands officially through Lord Palmerston. As however the question of the propriety of continuing the Toronto Observatory is now under the consideration of your Lordship, and of the gentlemen who formed the Magnetical and Meteorological Committee of the Royal Society, on the occasion of a letter which I had the honour to address to you at the close of the Session of the Society in June last, it has appeared to me most desirable to put your Lordship at once in possession of a copy of the resolutions which have been forwarded to me from the United States.

"I have the honour to be,

"My Lord, your Lordship's obedient Servant,
"EDWARD SABINE."

"The Earl of Rosse,
President of the Royal Society."

"Resolutions referred to in the preceding letters.

"At a Meeting of the American Association for the Advancement of Science at Newhaven in the United States in August 1850, the following Resolutions were unanimously adopted :—

"Resolved,—That in the foundation and maintenance of numerous Magnetical and Meteorological Observatories, the British Govern-

ment have evinced an appreciation of the claims of science, and a readiness to contribute liberally to its support, which challenge the admiration and demand the hearty acknowledgments of the scientific world.

"Resolved,—That the experiments which are now in progress at the Toronto Observatory, to test the practicability of self-registering photographic methods, the system of concerted Auroral Observations recently organized by Captain Lefroy, and the peculiar interest attached to magnetic observations made near the focus of maximum intensity, render it highly desirable that the Toronto Observatory should be continued in activity for a somewhat longer period.

"And inasmuch as a very extensive series of meteorological observations, embracing the entire area of the United States, is now in progress of organization by the Smithsonian Institution, and it would add exceedingly to the value of the proposed observations if simultaneous ones could be obtained from the region north of the United States, extending even to the shores of Hudson's Bay and the coast of Labrador; therefore—

"Resolved,—That the British Government and the Directors of the Hudson's Bay Company be invited to cooperate with the observers in the United States in united and systematic meteorological inquiries."

"3. *From Dr. Lloyd, President of the Royal Irish Academy,
to the Earl of Rosse, P.R.S.*

"Trinity College, Dublin,
November 13, 1850.

"DEAR LORD ROSSE,—I have to acknowledge the receipt of your Lordship's letter, in which you do me the honour to ask my opinion on the question of the continuance of the Magnetical Observatory at Toronto.

"I have long thought that the present state of some of the sciences connected with Terrestrial Physics demanded a *continuous* system of observation, and therefore the establishment of *permanent observatories* for their effective advancement; and I believe that I could easily cite, in support of this opinion, the authority of Humboldt, Herschel, Kupffer and others.

"I ventured to urge this view at the 'Magnetical Conference' held at Cambridge a few years ago, under the auspices of the British Association; and I believe that it was in the hope of carrying it out in this particular instance, that it was resolved to recommend to Her Majesty's Government to continue the observatory at Toronto for a limited time, in the hope that, before the close of the period, arrangements might be made with some of the colonial institutions to take it up.

"I am not aware what steps have been taken to carry out this latter object, or whether they have been taken and failed; should the latter be the case, the question is of course altered. But, even in that case, I would venture to suggest the importance of the *temporary*

continuance of the observatory on its present footing for some time longer, if it were only to carry out to its completion the trial of the self-registering of magnetical and meteorological instruments by photographic processes, which has been instituted there on so large a scale.

"The two methods which have been proposed for that purpose (and of which the importance has been recognized by Her Majesty's Government by the bestowal of liberal pecuniary rewards) are both in operation at Toronto, and under the direction of Captain Lefroy, an officer who is able to give them the fullest trial, as well as to improve and perfect them. So that an experiment of great importance to physical science would probably be interrupted, and lead to no conclusion, if the observatory were now to be discontinued.

"For these and other reasons I believe that it is desirable that an application should be made to Her Majesty's Government, requesting them to direct the continuance of the Magnetical Observatory at Toronto for some time longer, in case that none of the local institutions are in a condition to undertake its management.

"I remain, dear Lord Rosse,

"Yours very faithfully,

"H. LLOYD."

"*The Earl of Rosse, &c. &c.*"

"4. *From Sir John Herschel, Bart., to the Earl of Rosse, P.R.S.*

"32 Harley Street, December 28, 1850.

"MY DEAR LORD ROSSE,—I entirely agree in the view taken by Dr. Lloyd relative to the Toronto Observatory. It has become, from the fine series of observations already made there, a local centre of reference for the magnetic and meteorological observations of the whole of Canada and Northern America, of the greatest importance. If continued, whether under the Colonial Government alone or aided by the Home Government, it would become the national observatory, the centre of diffusion of astronomical and of all exact scientific inquiry, and the zero-point of a future trigonometrical survey.

"If only temporarily continued, the working out of the recently adopted methods of photographic registry would form a very valuable contribution to the progress of those new methods, which promise to supersede all others—both in point of exactness and of economy; and I think it would be very desirable, if so continued, that some attempt should be made, *pendente*, to influence the Colonial authorities definitively to take it up. Perhaps this might be made a condition of another three years' continuance,—I mean that it might be granted *provided* a pledge could be obtained from the Colonial authorities that it should afterwards be a Colonial Establishment.

"I remain,

"My dear Lord Rosse, yours very truly,

"J. F. W. HERSCHEL."

"5. *From the American Academy of Arts and Sciences to the Earl of Rosse, P.R.S.*

"Cambridge, U.S.,
Nov. 25, 1850.

"MY LORD,—The undersigned, a Committee of the American Academy of Arts and Sciences, have been directed to address your Lordship, on the subject of continuing the meteorological and magnetical observations at Toronto in Upper Canada. The Academy has been led more particularly to take this step, in consequence of the organization of a uniform system of meteorological observations in the United States, under the auspices of the Smithsonian Institution. Thirty-seven stations have been established in the State of New York, and twelve in the State of Massachusetts, under the superintendence of one of the Committee (Professor Guyot), and are now in successful operation. It is unnecessary to say, that this arrangement furnishes very important means of comparison with the observations made at Toronto. This advantage will be still further increased, by the addition which will no doubt be made, in other parts of the United States, to the number of stations.

"These circumstances render it peculiarly desirable that the observations at Toronto should not be suspended; and the undersigned are instructed to express to your Lordship the earnest wish, entertained by the American Academy, that the requisite appropriations for their continuance should be made by Her Majesty's Government, and the hope that the Royal Society will exert its great influence to this end.

"We have the honour to remain,

"With the highest respect,

"Your Lordship's obedient Servants,

"EDWARD EVERETT,

"WM. CRANCH BOND,

"A. GUYOT,

"JOSEPH LOVERING,

"JON. P. HALL,

} Committee."

"The Earl of Rosse,
President of the Royal Society."

"6. *Resolution adopted by the Council of the Royal Society,*
January 16, 1851.

"Resolved,—That the continuance of the Toronto Observatory be recommended to Her Majesty's Government, and that the President be requested to communicate with Lord John Russell on the subject."

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